Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Second and Final Bill

Quality Control Reports

BOOK NO-02

TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID : CP-RW-2022-01-06-05 **Date: 10-12-21**

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK D/W.O/199/2019-20

Date of Receipt : 08-12-21

Type of Mix : DBM-Plant (Dense Bituminous Macadam)

Date of test : 08-12-21

Weight of Sample : 5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10 (grading -2)
37.5	0	0	0.0	100	100
26.5	170	170	3.4	96 6	90-100
19	1015	1185	23.7	76 3	71-95
13.2	526	1711	34 2	65 8	56-80
4.75	1147	2858	57 2	42 8	38-54
2.36	718	3576	71.5	28 5	28-42
0.3	1072	4648	93.0	7.0	7-21
0.075	231	4879	97.6	2.4	2-8
PAN	121	5000	0.0	0	0

* The results obtained are satisfactory as per standard requirements.

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ಜ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು-106

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Authorized Signatory
Quality Manager

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID : **CP-RW-2022-01-06-05** **Date: 11-12-21**

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

Date of Receipt : 08-12-21

Type of Mix : DBM (Dense Bituminous Macadam)

Date of test : 08-12-21

Table 500-6 : Physical Requirements fo Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.4	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	11.8		
Strength	Aggregate Impact Value	22.2	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.65	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.16	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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ಬ.ಬ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು-೦೬

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TESTS RESULTS ON STABILITY OF MIX

Lab ID : **CP-RW-2022-01-06-05** **Date: 11-12-21**

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

Date of Receipt : 08-12-21

Type of Mix : DBM (Dense Bituminous Mecadam)

Date of test : 08-12-21

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.30	11.43	9KN(Min)
2	Marshal flow at 60°C, mm	3.66	3.74	2-4
3	Percent air Voids	4.52	4.58	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.62	14.67	13-15
5	Percent Voids filled with Bitumen(VFB %)	70.13	70.28	65-75
6	Density, g/cc	2.43	2.41	–

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID : **CP-RW-2022-01-06-05** **Date: 11-12-21**

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

Date of Receipt : 08-12-21

Type of Mix : DBM(Dense Bitumnous Macadam)

Date of test : 08-12-21

Type of Binder : 60/70

% of Binder Used : 5.0%

Weight of Aggregate : 200.0 gm

Weight of Binder : 10.0 gm

Temperature of water bath : 40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

* The results obtained are satisfactory as per standard requirements.

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR DBM (IS 2386:(Part I) 1963 (RA2011)

Lab ID	:	**CP-RW-2022-01-06-05** **Date: 20-12-21**
Project Name	:	Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division
Agency	:	M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010
Customer Reference	:	BBMP/EE/YNK.D/W.O/199/2019-20
Date of Receipt	:	18-12-21
Type of Mix	:	DBM (Dense Bituminous Macadam)
Date of test	:	18-12-21

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	477	476
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.6	4.8
4	Average percentage	%	4.7	

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Lab ID : CP-RW-2022-01-06-05 Date: 20-12-21

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 477

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	0	0	0.00	100.0	90-100
19	54	54	11.32	88.7	71-95
13.2	49	103	21.59	78.4	56-80
4.75	165	268	56.18	43.8	38-54
2.36	70	338	70.86	29.1	28-42
0.3	78	416	87.21	12.8	7-21
0.075	25	441	92.45	7.5	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 476

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	0	0	0.00	100.0	90-100
19	56	56	11.76	88.2	71-95
13.2	53	109	22.90	77.1	56-80
4.75	169	278	58.40	41.6	38-54
2.36	61	339	71.22	28.8	28-42
0.3	73	412	86.55	13.4	7-21
0.075	32	444	93.28	6.7	2-8

* The results obtained are satisfactory as per standard requirements

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Certificate No.: TC-5548

TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	CP-RW-2022-01-06-05 **Date: 15-12-21**
Project Name	:	Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division
Agency	:	M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010
Customer Reference	:	BBMP/EE/YNK.D/W.O/199/2019-20
Date of Receipt	:	13-12-21
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	13-12-21
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	77	77	1.5	98.5	90-100
9.5	716	793	15.9	84.1	70-88
4.75	879	1672	33.4	66.6	53-71
2.36	573	2245	44.9	55.1	42-58
1.18	521	2766	55.3	44.7	34-48
0.6	522	3288	65.8	34.2	26-38
0.3	536	3824	76.5	23.5	18-28
0.15	445	4269	85.4	14.6	12-20
0.075	314	4583	91.7	8.3	4-10
PAN	417	5000	100	0.0	0

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2022-01-06-05** **Date: 16-12-21**
Project Name	:	Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division
Agency	:	M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010
Customer Reference	:	BBMP/EE/YNK.D/W.O/199/2019-20
Date of Receipt	:	13-12-21
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	13-12-21

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.0	Minimum Retained Coating 95%
2	98.5	1.5		
3	97.5	2.5		

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

b ID : CP-RW-2022-01-06-05 Date: 16-12-21

oject Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

ency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

stomer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

te of Receipt : 13-12-21

pe of Mix : BC (Bituminous Concrete)

te of test : 13-12-21

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	10.1	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.5		
Strength	Aggregate Impact Value	22.4	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.56	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.25	Maximum 2%	IS:2386 Part III

The results obtained are satisfactory as per standard requirements.

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TESTS RESULTS ON STABILITY OF MIX

Lab ID : **CP-RW-2022-01-06-05** **Date: 16-12-21**

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

Date of Receipt : 13-12-21

Type of Mix : BC (Bituminous Concrete)

Date of test : 13-12-21

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	10.38	10.47	10KN(min)
2	Marshal flow at 60°C, mm	3.47	3.23	2-4
3	Percent air Voids	4.38	4.19	3-5
4	Percent Voids in mineral Aggregate(VMA %)	13.38	13.49	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.56	71.37	65-75
6	Density, g/cc	2.26	2.25	–

* The results obtained are satisfactory as per standard requirements.

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Lab ID : CP-RW-2022-01-06-05

Date: 22-12-21

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 475

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	9	9	1.9	98.1	90-100
9.5	73	82	17.3	82.7	70-88
4.75	116	198	41.7	58.3	53-71
2.36	76	274	57.7	42.3	42-58
1.18	22	296	62.3	37.7	34-48
0.6	25	321	67.6	32.4	26-38
0.3	46	367	77.3	22.7	18-28
0.15	43	410	86.3	13.7	12-20
0.075	41	451	94.9	5.1	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	11	11	2.3	97.7	90-100
9.5	75	86	18.2	81.8	70-88
4.75	112	198	41.9	58.1	53-71
2.36	72	270	57.1	42.9	42-58
1.18	26	296	62.6	37.4	34-48
0.6	29	325	68.7	31.3	26-38
0.3	49	374	79.1	20.9	18-28
0.15	40	414	87.5	12.5	12-20
0.075	34	448	94.7	5.3	4-10

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

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TEST REPORT ON BITUMEN

Lab ID	:	**CP-RW-2022-01-06-05** **Date: 08-12-21**
Project Name	:	Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division
Agency	:	M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore-560010
Customer's Reference	:	BBMP/EE/YNK.D/W.O/199/2019-20
Date of Receipt	:	06-12-21
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	06-12-21

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	62	60 to 70
2	Softening Point, °C	52.4	Min. 40°C
3	Ductility, cm	93	Min. 75cm
4	Flash point, °C	238	Min. 220°C
	Fire point, °C	269	

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2022-01-06-05

Project Name : Asphalting to Sainagara phase-I and surrounding ares in ward no-03 Yelahanka satellite Town sub Division — **Date: 22-12-21**

Agency : M/s. Technical Manager (West), KRIDL, Bangaluru, 5th Block, 17th Main Shivakumar Swamy Building. Bhashyam Circle Bangalore-560010

Customer Reference : BBMP/EE/YNK.D/W.O/199/2019-20

Date of Receipt : 21-12-21

Type of Mix : Tack coat

Date of test : 21-12-21

SLNo	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.78	0.748
4	Final weight of plate after application of tack Coat (c)	Kg	0.803	0.771
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq m	0.256	0.256
7	Average	Kg/sq m	0.256	
8	Specified Limit	Kg/sq m	0.250 Kg/sq m	

* The results obtained are satisfactory as per standard requirements.

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